What is claimed is:

1. Crystal oriented ceramics composed of a polycrystalline substance of an isotropic perovskite compound represented by the general formula:

$$\{Li_x(K_{1-y}Na_y)_{1-x}\}\{Nb_{1-z-w}Ta_zSb_w\}O_3$$

(wherein, $0 \leq x \leq 0.2$, $0 \leq y \leq 1$, $0 \leq z \leq 0.4$, $0 \leq w \leq 0.2$, $x + z + w > 0$), and a specific crystal plane of each crystal grain that composes said polycrystalline substance is oriented.

2. Crystal oriented ceramics according to claim 1 wherein, the degree of orientation of the pseudo-cubic {100} plane as determined according to the Lotgering method is 30% or more.

3. Crystal oriented ceramics according to claim 1 wherein, the piezoelectric d_{31} constant at room temperature is 1.1 times or more that of a non-oriented sintered compact having the same composition.

4. Crystal oriented ceramics according to claim 1 wherein, the electromechanical coupling coefficient k_p at room temperature is 1.1 times or more that of a non-oriented sintered compact having the same composition.

5. Crystal oriented ceramics according to claim 1 wherein, the piezoelectric g_{31} constant at room temperature is 1.1 times or more that of a non-oriented sintered compact having the same composition.

6. Crystal oriented ceramics according to claim 1 wherein, the rate of improvement resulting from orientation in displacement generated under electric field driving conditions having a constant amplitude of an electric field strength of 100 V/mm or more at a predetermined temperature equal to or below the Curie temperature is 1.1 times.

7. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of displacement under electric field driving conditions having a constant amplitude of an electric field strength of 100 V/mm or more over an arbitrary

temperature range of 100°C or more equal to or lower than the Curie temperature is within ±20%.

8. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of $E_{331arge}$ as measured according to formula A1 under electric field driving conditions having a constant amplitude of an electric field strength of 100 V/mm over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature is within ±15%; wherein, the amount of polarization is measured from a polarization-electric field hysteresis loop in the case of driving by applying a high voltage, and $E_{331arge}$ is the dielectric constant in a strong electric field based on this (dynamic dielectric constant), and is defined by equation A1:

$$E_{331arge} = P_{max}/(EF_{max} \times \varepsilon_0) = (Q_{max}/A)/(V/L) \times \varepsilon_0) \qquad \text{A1}$$

(wherein, Here, P_{max} represents the maximum charge density (C/m^2), EF_{max} represents the maximum electric field strength (V/m), Q_{max} represents the maximum charge (C), A represents the electrode surface area (m^2), ε_0 represents the dielectric constant in a vacuum (F/m), L represents the original length prior to applying a voltage (m), and V represents the applied voltage (V)).

9. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of the value defined by $D_{331arge}/(E_{331arge})^{1/2}$ under electric field driving conditions having a constant amplitude over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature is within ±10%; wherein, $D_{331arge}$ is the displacement generated in a direction parallel to the direction in which voltage is applied in the case of applying a high voltage, and is defined by equation A2:

$$D_{331arge} = S_{max}/EF_{max} = (\Delta L/L)/(V/L) \qquad \text{A2}$$

(wherein, S_{max} represents the maximum strain, ΔL represents the displacement induced by the electric field

(m), L represents the original length prior to applying a voltage (m), and V represents the applied voltage (V)).

10. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of the value defined by $D_{331arge}/E_{331arge}$ under electric field driving conditions having a constant amplitude over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature is within ±9%.

11. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of displacement generated under constant energy driving conditions over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature is within ±10%.

12. Crystal oriented ceramics according to claim 1 wherein, there is a temperature range where the amount of fluctuation of displacement generated under constant charge driving conditions over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature is within ±9%.

13. Crystal oriented ceramics according to claim 1 wherein, the crystal system is a tetragonal system over an arbitrary temperature range of 100°C or more equal to or lower than the Curie temperature.

14. A production method of crystal oriented ceramics comprising:

a mixing step in which a first anisotropic shaped powder, for which the growth plane has lattice coherency with a specific crystal plane of the isotropic perovskite compound according to claim 1, is mixed with a first reaction raw material that reacts with said first anisotropic shaped powder and at least forms the isotropic perovskite compound;

a molding step in which the mixture obtained in the mixing step is molded so that the first anisotropic shaped powder is oriented; and,

a heat treatment step in which the molded product obtained in the molding step is heated to cause a reaction between the first anisotropic shaped powder and the first reaction raw material.

15. A crystal oriented ceramics production method according to claim 14 wherein, the first anisotropic shaped powder is a plate-like powder having the pseudo-cubic {100} plane for its growth plane and is represented by the following general formula:

$$\{Li_x(K_{1-y}Na_y)_{1-x}\}\{Nb_{1-z-w}Ta_zSb_w\}O_3$$

(wherein, x, y, z and w are $0 \leq x \leq 1$, $0 \leq y \leq 1$, $0 \leq z \leq 1$ and $0 \leq w \leq 1$, respectively).

16. A piezoelectric element comprised of a piezoelectric material composed of crystal oriented ceramics according to claim 1.

17. A dielectric element comprised of a dielectric material composed of crystal oriented ceramics according to claim 1.

18. A thermoelectric conversion element comprised of a thermoelectric conversion material composed of crystal oriented ceramics according to claim 1.

19. An ion conducting element comprised of an ion conducting material composed of crystal oriented ceramics according to claim 1.